Name: _____ Date: _____

LAB 1: Plane Mirror Lab

Part A: Reflection on Plane Mirror (Law of Reflection)

Purpose:

To investigate the **Law of Reflection** using a **plane mirror**.

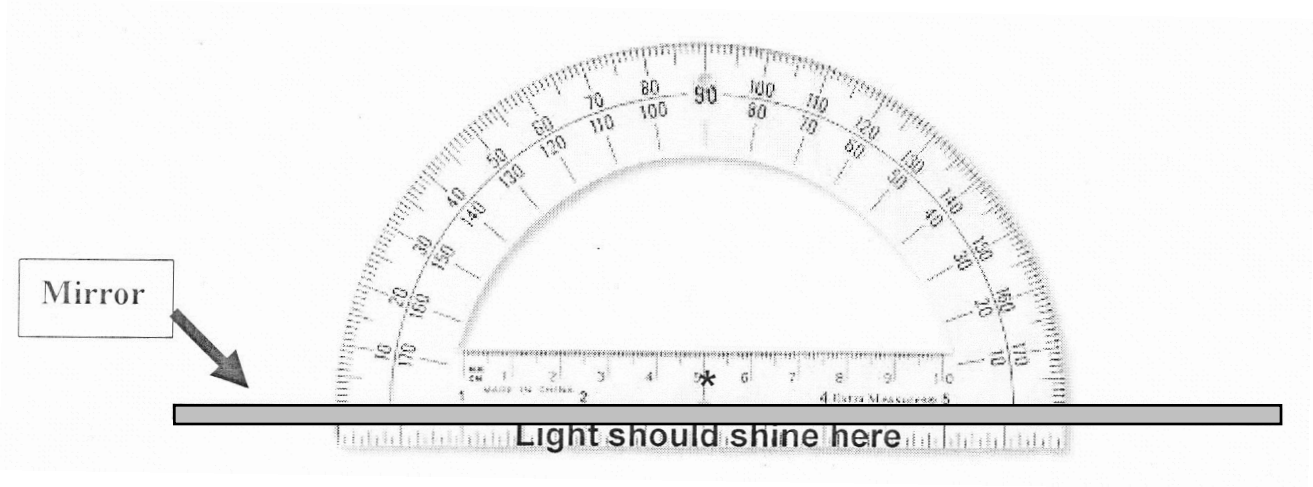
Materials:

Ray box Plane Mirror Protractor Ruler Sharp Pencil

Procedures:

1. Place the **plane mirror** on the diagram below ***where it says mirror***.
2. Shine a **single light ray** from the ray box along the 90° angle of protractor to the mirror's surface.
   NOTE: Try to shine the light so that it will always hit "***Light should shine here***" spot.
   This will be the **NORMAL**. **Draw and label this line**.
3. Move the ray box along **70°** angle of protractor to the mirror's surface.
4. Shine a **single light ray** from the ray box along **70°** on your left. Trace the incident ray and the reflected ray of light produced. Label each pair of light rays "**70°".**
5. Repeat **step 3 and 4** at different positions **- 45°, 25°, 5°**, so that incident light ray strikes the mirror at the different angles each time.
6. **Label each pair of light rays** with the corresponding numbers.
7. Make sure **use arrow** to show the **direction** of the light rays.
8. Label one light ray using the key terms: **Incident Ray, Reflected Ray, Normal, Angle of Incidence (i), Angle of Reflection (r), Point of Incidence**.

Observation:



Complete the Chart below.

Position of Light Ray at	Angle of Incidence (i)	Angle of Reflection (r)
70°		
45°		
25°		
5°		

Part B: Locating Images in a Plane Mirror

Purpose:

To investigate how an image is formed in a plane mirror and the characteristics of the image formed.
RECALL: An image can be described by **four characteristics**: **Size, Attitude, Location and Type (SALT).**

Materials:

Ray box Large Plane Mirror Small Plane Mirror Ruler

Procedures:

1. Look into the **large** plane mirror. **Answer Question (a) and (b).**

Observation:

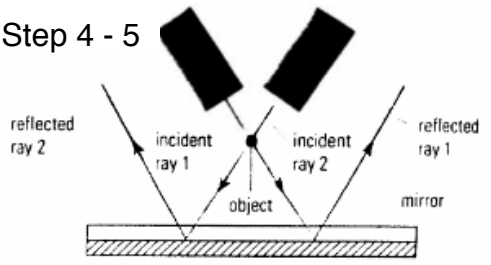
a) What is the **size of your image** compared with you, the object? _____

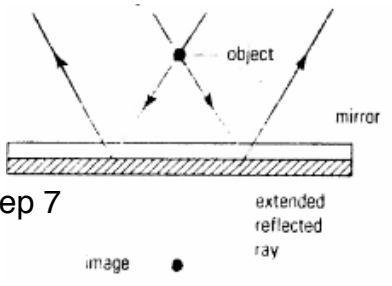
b) What is the **attitude** of your image? _____

Procedures:

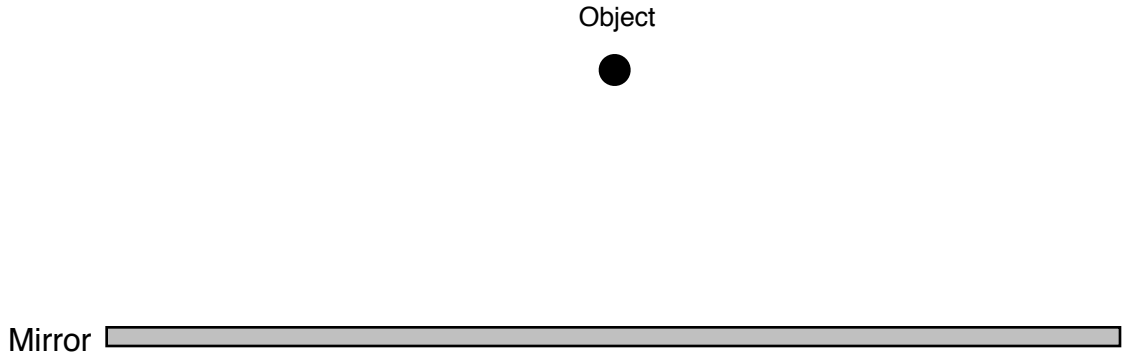
2. Use the diagram on the **page 3,** place the **small** plane mirror ***where it says mirror***.
3. Get down **level with the mirror** so you can see the **image of the dot** (object). Look at the image from several viewpoints.
4. Shine an **incident ray at an angle** from the ray box through the middle of the dot to the mirror. **Draw the incident and reflected rays**.
5. Move the ray box, and aim a **second incident ray at an angle** through the middle of the dot to the mirror. Again, **draw the incident and reflected rays**. Remove the mirror.
6. To **locate the image**, use a ruler to draw **dotted lines extending the reflected rays back behind the mirror**. **Mark** the point where the extended rays meet and draw the image of the dot. Label this dot ***image***.
7. On your diagram, **measure the shortest distance** from the mirror to the dot (object). (This is the **object distance**).
8. Record the **object distance** in **(c)**.
9. On your diagram, **measure the shortest distance** from the mirror to the image. (This is the **image distance**).
10. Record the **image distance** in **(d)**.

Step 4 - 5





Step 7



Observation:

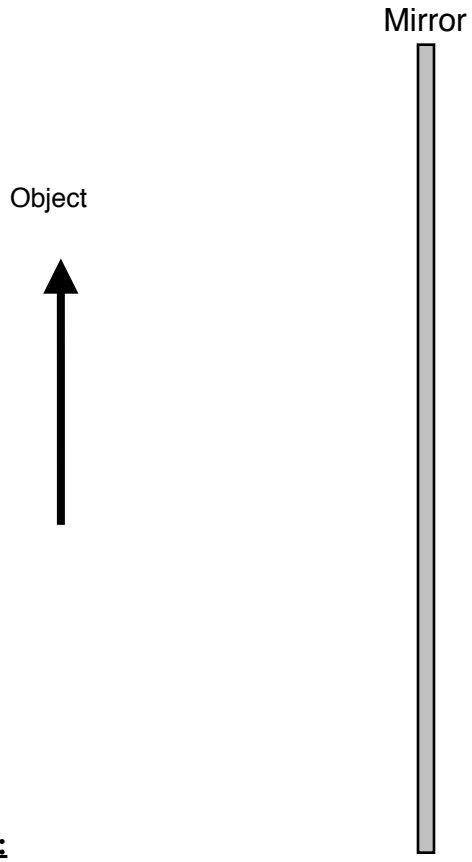
c) Object distance (distance from object to the mirror) is _____.

d) Image distance ((distance from image to the mirror) is _____.

Procedures:

11. Use the diagram on the **page 4,** place the plane mirror ***where it says mirror***. Look at the mirror to see the **image of the arrow (object)**.
12. Shine an **incident ray** from the ray box **at 90°** through the **top of the arrow** (object) to the mirror. **Draw the incident and reflected rays**.
13. Move the ray box, and aim a **second incident ray at an angl**e through the **top of the arrow** (object) to the mirror. Again, **draw the incident and reflected rays.**
14. Shine the **third incident ray** from the ray box **at 90°** through the **bottom of the arrow** (object) to the mirror. **Draw the incident and reflected rays**.
15. Move the ray box, and aim a **second incident ray at an angle** through the **bottom of the arrow** (object) to the mirror. Again, **draw the incident and reflected rays.**
16. When you finished, your diagram should have **4 incident rays** and **4 reflected rays**. Remove the mirror.
17. To **locate the image**, use a ruler to draw **dotted lines extending all the reflected rays back behind the mirror**. **Mark the point** where the **extended rays meet**. Join the top and bottom of the image with an arrow, and label the ***image***.
18. On your diagram, **measure the shortest distance** from the mirror to the object. (This is the **object distance**). Record the **object distance** in **(e)**.

19. On your diagram, **measure the shortest distance** from the mirror to the image. (This is the **image distance**). Record the **image distance** in **(f)**.
20. On your diagram, **measure the object height and image height.** Record them in **(g) and (h)**.



Observation:

e) Object distance ((distance from object to the mirror) is _____.

f) Image distance ((distance from image to the mirror) is _____.

g) Object height (length of the arrow object) is _____.

h) Image height (length of the arrow image) is _____.

Discussion:

1. How does the **image distance** compare with the **object distance**?

2. How does the **size of the image** compare with the **size of the object**?

3. Is the image **real** or **virtual**? _____
   (Note: a real image can be seen on a screen. You can checked by placing a piece of paper where the image seems to be located. If you can see the image on the paper, it is real. If you cannot see the image, then it is virtual.)